LAND USE

HISTORIC AND RECENT LAND USE

Prairies dominated the landscape of the Nodaway River basin prior to settlement. Small areas of upland timber were restricted to deep narrow ravines. The timber was often found only in isolated pockets at the upper end of the ravines. Common prairie species included Indian grass, big and little bluestem, buffalo grass, blue and hairy grama, and switch grass. Forest species included elm, ash, and cottonwood along streams and oak-hickory forest types on the uplands (USDA-SCS 1982). Conservative estimates indicate 80% of Nodaway County and 50% of Holt and Andrew counties were once dominated by prairie species (Schroeder 1982). The majority of the basin in Iowa was historically covered by prairie grassland (USDA 1981). A county map from the 1850's for Page County, Iowa indicated a timbered corridor existed along streams of the Nodaway River basin (Varland 1984). Settlement and modification for agricultural production by man has eliminated most of these historic habitats in the Nodaway River basin.

The Nodaway River has been frequented by people for several thousand years, as chronicled by numerous archaeological sites and discoveries in the basin. Fox, Otoe, Ioway, Missouri, Pottawattamie, and Sioux were the Native American inhabitants of the basin. Settlers begin moving to the region in the 1830's. Most were from the eastern states of Kentucky, Tennessee, Georgia, Virginia, Ohio, and Indiana. The Missouri portion of the basin was at one time known as the "Platte Territory" and was acquired by the State of Missouri in the "Platte Purchase" of 1836. Most Native Americans that remained in the area were paid cash for rights to their land and were displaced to land southwest of the Missouri River in what was then the Kansas Territory.

The word "Nadowa" and similar sounding terms are found in many Indian languages. The Algonquian tribes use of the name was applied to mean "utter detestation" usually in reference to bitter enemies. The Menominee, Chippewa, and Ottawa all have terms similar to "Nadowa" that refer to snakes, usually rattlesnakes. "Nadowe" was used by Siouan tribes indicating or in reference to enemies, chiefly Iowa and Teton. The term was often associated with snakes generally thought to be massasauga rattlesnakes (Hodge 1912). The application of the name to the Nodaway River is believed to have described it as being twisted or sinuous like a snake. In the past the name may have been an apt description but the present day Nodaway River resembles a straight ditch more than a snake-like meandering river.

The Lewis and Clark expedition camped near and mentioned the "Nodawa River" and "Little Nodawa and Great Nodawa" islands in the journal of their expedition. They camped on the north shore of the Missouri River near the head of "Nodawa Island" on July 8, 1804. On their return journey they hunted near the Nodaway River and passed by on September 11, 1806 (Biddle 1962).

Settlement first took place in forested areas, and the adjoining prairies were used as free range for cattle. These lands had an important role in the development of the early Missouri cattle industry. Preferred sites were those on the edge of the timber with close association to both water and native prairie. The settlement of prairies soon followed the settlement of forested lands.

Settlement of wet prairies was avoided due to their reputation for producing fevers and respiratory ailments, but they were used as wintering areas for cattle. Native grasses were also cut for hay (Schroeder 1982).

The arrival of more people and cattle, along with the arrival of commercialized farming, marked the beginning of the end for native prairies in the basin. Destruction of the native prairie can be attributed to three main factors: plowing, overgrazing, and fire control (Schroeder 1982).

Cultivation began in the woodland soils along the streams but soon moved to adjoining prairies, as people realized these soils produced better and more plentiful crops. Intense cultivation soon followed on these lands and continued until nearly all lands were converted to agriculture (Schroeder 1982). The first railroads came to the basin in the 1870's. This allowed easy access to better tools for farming and provided for transportation of goods to large city markets. The last areas cultivated were the wet bottom lands. Building ditches and draining these areas helped convert them to agricultural production. Groups of farmers began stream channelization in the early 1900's, and a large part of the Nodaway basin was channelized by the 1930's (USCOE 1973, USDA 1981). This increased the amount of tillable acreage, intensified erosion, and permanently altered the natural quality of the basin's aquatic resources (Kramer 1993).

Overgrazing was also responsible for the destruction of large amounts of native prairie. Native species could not tolerate the intensive grazing and were replaced by introduced species (Schroeder 1982). The practice of fire control contributed to the change in composition of native prairies and eventual domination by invading woody species. Fires, which historically had burned uncontrolled, were important in keeping prairie habitats free of colonizing woody species. The controlling of fires, mainly for safety reasons, allowed woody species to invade. To most settlers of the time, this was viewed as a positive change (Kramer 1993).

The fertile soils and favorable climate of the basin make it an outstanding grain producing area. The majority of basin lands are in cultivation. Land use (Figure lu) in the Nodaway River basin during the early 1980's was 70 % agricultural cropland, 17 % pasture land, six percent forest, and seven percent other uses (USDA-SCS 1982; Table 1). Eighty-five percent of the basin was in row crops or pasture in 1995 (MDNR 1995). Since the 1970's, cropland acreage has increased, while set aside land, pasture, and forest lands have decreased. Eighty-seven percent of the bottom land was in row crop agriculture in 1982. Projected land use pattern changes were for more upland conversion to row crop agriculture, with a concurrent increase in erosion and flooding (USDA-SCS 1982). This could cause lower water quality and increased habitat degradation in the Nodaway River basin.

Forest resources are of minor importance to landowners in this agricultural row crop oriented basin. Existing forested lands are generally in poor condition. Most of the forest is found in fence rows, narrow riparian corridors, and areas of terrain that cannot be cultivated. Most trees remain on the poorest soils and have growth rates that are far below those expected from intensively managed stands. More than half of the basin's forested lands are grazed. Overgrazing deteriorates the forest floor, resulting in much higher than normal erosion. In extreme cases it can cause destruction of forest blocks (USDA-SCS 1982).

Table 1. Land use estimates from Conservation Needs Inventory data (USDA 1982).

	Cropland	Pasture	Forest	Other	Urban	Federal	Water
Total Acres	817,660	195,760	64,840	41,300	40,100	1,500	3,640
Total (%)	70	17	6	4	3	0	0
Iowa Total (%)	49	13	2	2	2	0	0
Missouri Total (%)	21	4	4	2	1	0	0
Iowa Total (%)*	73	19	2	3	3	0	0
Missouri Total (%)*	65	13	13	6	3	0	0
Bottom land Total (%)	87	4	7	2	0	0	0

*percents indicate total for each within that states portion of the basin.

SOIL CONSERVATION PROJECTS

The Nodaway River basin is in the second most erosive area in the United States (USDA-SCS 1983). Because of intense erosion problems in the Platte territory area (includes the Nodaway River basin), the United States Department of Agriculture (USDA) targeted the area in the mid 1980's with programs to reduce erosion, increase productivity, and help the income of farmers in the area (USDA-SCS 1983). Emphasis was placed on conservation tillage, and in particular no-till cultivation. There are several conservation programs, both state and federally sponsored, that provide technical and/or financial assistance to land owners in the basin.

Two available programs in the Missouri portion of the basin are Special Area Land Treatment (SALT) and EARTH projects, sponsored by the Missouri Department of Natural Resources (MDNR). These programs are coordinated through local Soil and Water Conservation Districts (SWCD) and make resources available for land owners in each target watershed. There are no EARTH projects in the basin at this time.

SALT projects focus on particular watersheds, that through land owner cooperation, strive to improve soil conservation. The SALT programs use total resource management planning to treat land so that all its resources are used effectively, while being protected from excessive soil erosion. Other goals of the program include: improved water quality and reduced sedimentation; increased use of conservation oriented agricultural practices; improved grassland establishment; better management of animal waste; increased timberland productivity; and improved wildlife habitat. Current SALT projects in the basin and their status are found in Table 2.

Watershed Protection and Flood Prevention Act (Public Law 83-566) watershed projects are federally funded and have been common practices in the Nodaway River basin (Table 3). The act authorizes the USDA through the Natural Resources Conservation Service (NRCS) to assist local

Table 2. Status of Special Area Land Treatment (SALT) projects within the Nodaway River basin (Missouri) as of April 1997.

Natural Resources Conservation Service District	Project Name	Watershed Acres	Acres Needing Treatment	Completion Date
Holt	Hickory Creek	5,900	Unknown	Fiscal 1999
Holt	Nichols Creek	4,338	2,927	Fiscal 1997
Andrew	Lower Pedlar Creek	3,989	1,933	Fiscal 1995
Andrew	Upper Lincoln Creek	7,835	3,981	Fiscal 1995
Nodaway	East Branch Elkhorn Creek	5,340	3,450	Fiscal 1999
Nodaway	Jenkins Creek	5,400	3,824	Fiscal 1995
Nodaway	East Branch Jenkins Creek	3,784	1,709	Fiscal 1999

Table 3. Information on PL 83-566 watershed projects in the Nodaway River basin as of January 1997. (USDA-SCS 1991, USDA-NRCS 1997)

Watershed	Acres	Status
Hoover-Frankum (MO)	18,307	completed October 1975
Mill Creek (IA/MO)	25,500	approved July 1989
Clear, Cayhoga, and Muddy Creek (MO)	74,320	currently inactive application
A & T Long Branch (IA)	16,362	operations stage
Hacklebarney (IA)	44,850	operations stage
West Douglas (IA)	6,370	completed 1969
Show Creek (IA)	14,245	application awaiting action
Walter's Creek (IA)	31,560	completed 1979
West Nodaway (IA)	101,125	application awaiting action

organizations in planning and installing watershed projects. The act uses a multi-purpose approach in solving water and land related resource problems including flood prevention, agricultural water management, water supply, recreation, and fish and wildlife development. There are three completed (PL 83-566) watershed protection projects, two under construction,

and one approved for construction, in the Nodaway River watershed (Table 3).

The Wetland Reserve Program (WRP) was authorized in 1990 and started enrolling land owners periodically in 1992. The WRP allows owners of eligible land to offer an easement for purchase and receive cost-share assistance in restoring wetlands. The benefits generated by this program include: reduced soil erosion; collection of sediments; flood water retention; improved water quality; ground water recharge; and improved fish and wildlife habitat. Eligibility requirements include: farmed wetlands; previously converted wetlands; existing wetlands; and those adjacent lands deemed necessary to protect restored areas. More information is available through local NRCS offices.

The Conservation Reserve Program (CRP) is a federally funded program in place to protect and enhance soil conservation, water quality, and fish and wildlife habitats. Land eligible for sign up includes cropland, marginal pasture, former CRP lands, and field margins including riparian corridors. More information is available through local NRCS offices.

PUBLIC AREAS

There are 15,759 acres (1% of watershed total) of public land in the Nodaway River basin. Table 4 contains specific information for public areas in the Missouri (Figure mp) portion of the basin and Table 5 gives Iowa (Figure ip) information. All of the Nodaway River basin public lands in Missouri (10,730 acres; Table 4) are managed by the Missouri Department of Conservation (MDC). Areas range from intensively managed wetland areas and fishing lakes to moderately managed upland and natural areas with both consumptive and non-consumptive uses. The Iowa public lands are managed by various county conservation boards, municipalities, and state agencies.

There are six stream access sites in the Missouri portion of the basin. The sites are all located on the mainstem Nodaway River and offer bank fishing and non-improved boat access. Three additional river accesses have been proposed in the MDC's stream acquisition plan (McPherson 1994). A site in Andrew County approximately seven miles northwest of Fillmore, Missouri was rated as a high priority acquisition. Two other sites in Nodaway County, Missouri (1/2 mile southwest of Skidmore and 1/2 mile west of Quitman) were rated as medium priority acquisitions. These new sites would offer boat access and bank fishing on the mainstem Nodaway River. Iowa has two stream access sites, one on West Nodaway Wildlife Area (West Nodaway River), and the other near Braddyville(Nodaway River) (Table 5).

Within the basin there are 38 public fishing impoundments in Missouri and eleven public areas with fishable waters in Iowa (Table 5). The largest lake in the basin is Lake Icaria in Iowa. This 700-acre reservoir on Kemp Creek (a tributary of the East Nodaway River) in Adams County has concrete boat ramps, a swimming beach, fishing jetties, a marina, and camping facilities. Viking Lake is a 137 acre lake on Dunns Creek (a tributary of the West Nodaway River) with facilities for boating, swimming, picnicking, and camping. Bilby Ranch Lake, the largest public impoundment in the Missouri portion of the basin, is 110-acres, has a concrete boat ramp, disabled user accessible restrooms, and a floating fishing dock. The MDC's Public Lakes Program Acquisition and Development Plan (Ryck 1991) lists Honey Creek Conservation Area

(CA) as medium priority and Monkey Mountain CA as low priority to receive additional lake and pond construction.

Table 4. Nodaway River basin public lands in Missouri.

Area Name	Acres	Description	Stream Frontage	County
Monkey Mountain CA	787 total	hiking trails, hunting, fishing primitive camping, river access	Nodaway River	Holt
Nodaway Valley CA	3,752 total 200 wetland 42 fishable	waterfowl hunting and viewing, hunting, fishing, primitive camping, river access	Nodaway River	Andrew Holt
Honey Creek CA	1,148 total	Hiking trails, hunting, fishing, primitive camping, river access	Nodaway River	Andrew
Bilby Ranch Lake CA	5,030 total 150 fishable	hiking trails, hunting, fishing, boat ramp, disabled accessible fishing dock, primitive camping	None	Nodaway
Tom Brown Access	7 total	river access - no boat ramp	Nodaway River	Andrew
Maitland Access	1 total	river access - no boat ramp	Nodaway River	Holt
Possum Walk Access	5 total	river access - no boat ramp	Nodaway River	Nodaway

Table 5. Nodaway River basin public lands in Iowa.

Area Name	Acres	Description	Stream Frontage	County
Adair Wildlife Area	352 total	hunting, wildlife viewing	None	Adair
Greenfield Lake	236 total 44 fishable	fishing, hiking, boat ramp	None	Adair
Highway 92 Wildlife Area	12 total	hunting, wildlife viewing	None	Adair
Ken Sidney Nature Area	107 total	hunting, hiking	None	Adair
Lake Nodaway	80 total 22 fishable	fishing, camping	None	Adair
Lake Orient	86 total 24 fishable	hunting, fishing, camping, boat ramp	None	Adair
Morman Trail Park	170 total 35 fishable	hunting, fishing, camping, swimming boat ramp, shooting range	None	Adair

Area Name	Acres	Description	Stream Frontage	County
Rex Sullivan Wildlife Area	160 total	hunting, wildlife viewing	None	Adair
Nodaway Wildlife Area	40 total 8 fishable	hunting, fishing, wildlife viewing	None	Cass
West Nodaway Wildlife Area	220 total	hunting, fishing, wildlife viewing	West Nodaway River	Cass
Siam Tract	110 total	hunting, wildlife viewing		Taylor
Braddyville Access	6 total	fishing	West Nodaway River	Page
Nodaway Valley Park	165 total	camping, hiking	None	Page
Ross Park	76 total 12 fishable	hunting, fishing, wildlife viewing, camping	None	Page
Stephens Tract Wildlife Area	4 total	wildlife viewing	None	Page
Lake Icaria Recreation Area	1,945 total 700 fishable	hunting, fishing, camping, hiking, swimming, boat ramp	None	Adams
Spring Lake Park	27 total 2 fishable	fishing, wildlife viewing	None	Adams
Erickson Prairie	3 total	native prairie	None	Montgomery
Hacklebarney Woods	230 total 10 fishable	hunting, fishing, camping, hiking, wildlife viewing	None	Montgomery
Viking State Park	1,000 total 137 fishable	fishing, camping, hiking, swimming	None	Montgomery

CORPS OF ENGINEERS 404 JURISDICTION

Most instream and some stream-side projects require 404 permits. Applications for permits should be directed to the appropriate U.S. Army Corps of Engineers office. The Nodaway River basin in Missouri is under the jurisdiction of the Kansas City District while the Iowa portion of the basin is managed by the Rock Island District.

Missouri: 700 Federal Building, Kansas City, MO 64106-2896, Attn: MRKOD-P, (816)426-5357

Iowa: Clock Tower Building, Rock Island, IL 61201-2004, Attn: NCROD-S, (309)788-6361 ext.6370

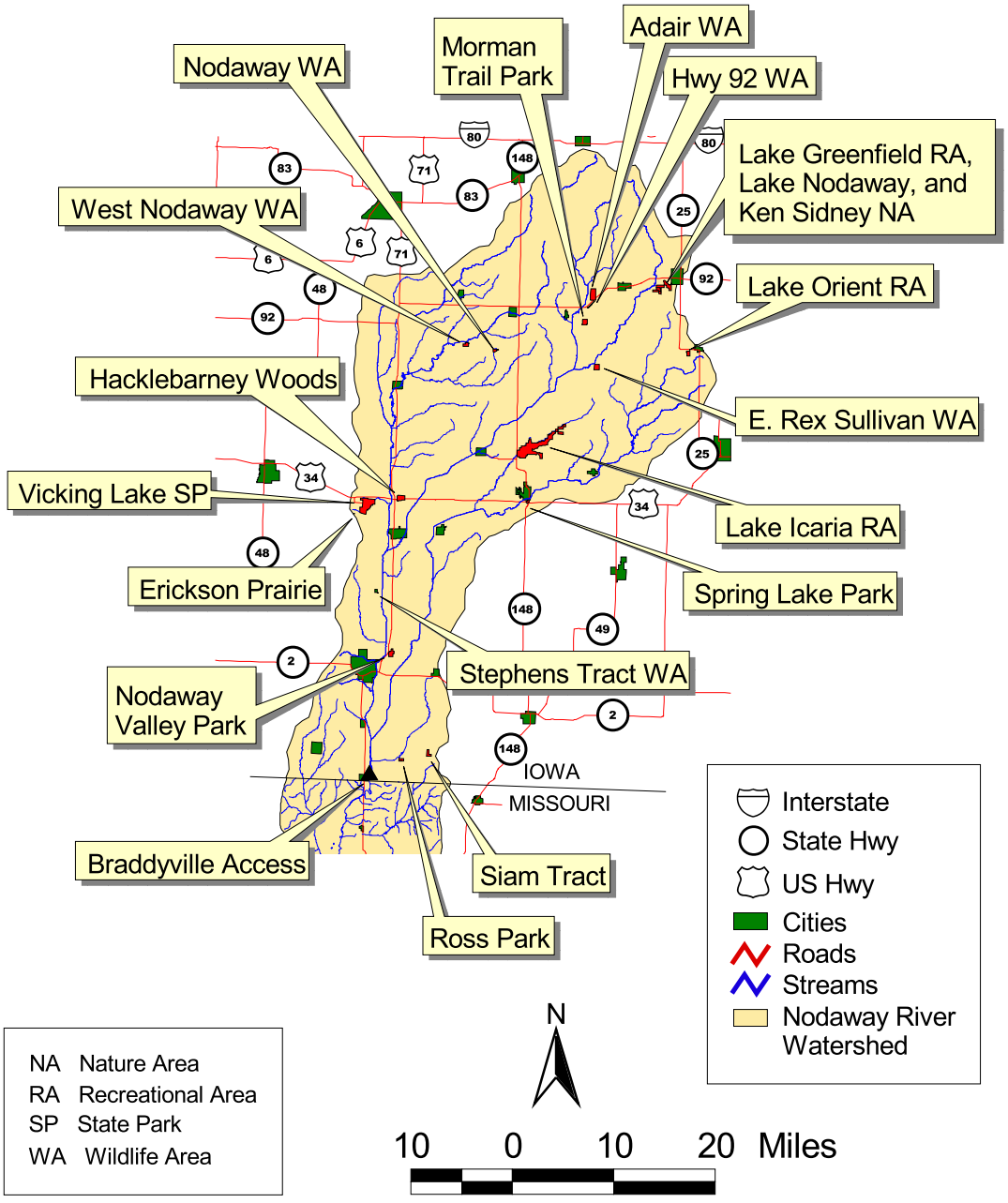

Figure ip. Location of publically owned land in the Iowa portion of the Nodaway River watershed.

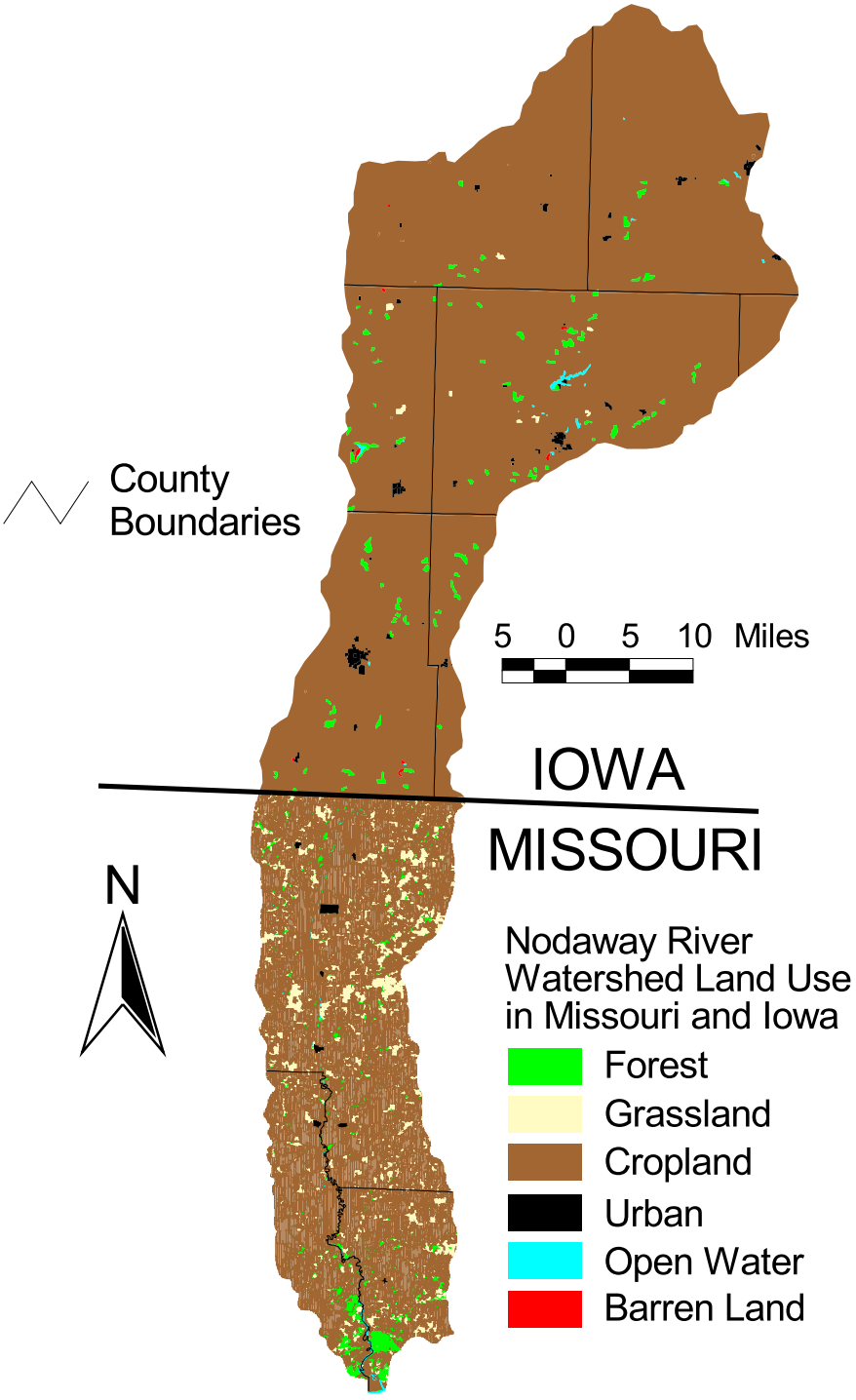

Figure lu. Land use/cover in the Nodaway River watershed (MORAP 1999, preliminary data).

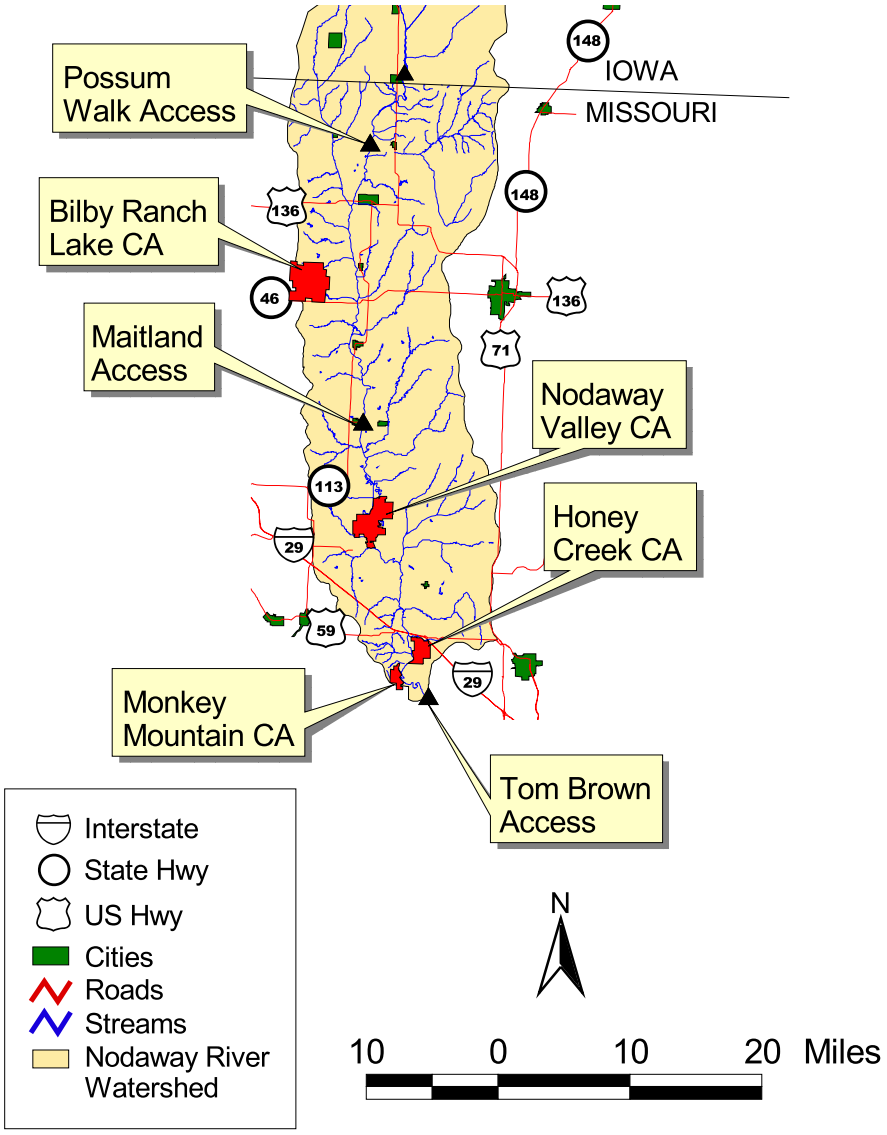

Figure mp. Location of publically owned land in the Missouri portion of the Nodaway River watershed. The abbreviation CA represents Conservation Area.